	A	B	C	D	E	F	G	H	I	J
1	**Table 1**									
2	**Summary of Potential to Emit**									
3	**MGPI of Indiana, LLC**									
4										
5	**Potential to Emit Before Controls (ton/yr)**									
6	***Significant Emission Units***	**PM**	**PM10**	**PM2.5**	**SO2**	**NOx**	**VOC**	**CO**	**GHG**	**Total HAPs**
7		**(tons/yr)**	**(tons/yr)**	**(tons/yr)**	**(tons/yr)**	**(tons/yr)**	**(tons/yr)**	**(tons/yr)**	**(tons/yr)**	**(tons/yr)**
8	***Project-affected emission sources***									
9	Proposed direct-fired DDG dryer (Proposed EU-39)	418.8	418.8	418.8	18.8	27.9	418.8	464.3	27,155	39.4
10	DDG Cooler and Transport System (EU-32)	35.8	21.68	7.88	-	-	9.16	-	-	1.28
11	Wet Cake Production, Storage, and Loadout (Proposed EU-40)	-	-	-	-	-	0.05	-	-	0.0022
12	Steam Tube Dryers (EU-32) Serving as Back-up	193.6	193.6	193.6	-	-	860.5	-	-	67.4
13	***Emission Units not affected (no change from prior permit representations)***									
14	One (1) pneumatic conveyor, identified as EU-11	189.2	189.2	16.1	-	-	-	-	-	-
15	One (1) corn receiving and storage system, identified as EU-12 (Stack S-111)	225.3	225.3	19.1	-	-	-	-	-	-
16	One (1) grain transport system, identified as EU-12 (Stack S-112)	20.3	20.3	1.73	-	-	-	-	-	-
17	Seven (7) storage bins, collectively identified as EU-13	20.3	20.3	1.73	-	-	-	-	-	-
18	Six (6) hammermills, collectively identified as EU-14	90.1	90.1	7.66	-	-	-	-	-	-
19	EU-21, which consists of fourteen (14) open fermenters	-	-	-	-	-	7.8	-	-	0.04
20	DDGS Storage (EU-34)	29.8	29.8	2.5	-	-	-	-	-	-
21	DDGS Rail/Truck Loadout (EU-35/EU-36)	27.2	27.2	2.3	-	-	-	-	-	-
22	DDGS Rail/Truck Loader(EU-37/EU-38)	0.27	0.27	0.05	-	-	-	-	-	-
23	Twenty-four (24) closed fermenters, collectively identified as EU-22	-	-	-	-	-	57.8	-	-	0.26
24	Two (2) beer wells, identified as EU-23 and EU-24	-	-	-	-	-	12.5	-	-	-
25	Distillation (EU-20 and EU-25 through EU-29)	-	-	-	-	-	0.1	-	-	3.43E-03
26	Four (4) paddle screens, identified as EU-31 and three (3) conveyors, identified as EU-33	-	-	-	-	-	440.0	-	-	2.00
27	One (1) wine room, identified as EU-41	-	-	-	-	-	19.5	-	-	-
28	One (1) tank farm, identified as EU-42	-	-	-	-	-	19.0	-	-	-
29	EU-43, which consists of Building 88	-	-	-	-	-	4.7	-	-	-
30	One (1) mini-tank farm, identified as EU-45	-	-	-	-	-	3.6	-	-	-
31	One (1) barrel and emptying operation, identified as EU-61	-	-	-	-	-	12.0	-	-	-
32	Six (6) warehouses, identified as EU-71 through EU-76	-	-	-	-	-	1867.4	-	-	-
33	One (1) steam boiler, identified as EU-96	1.99	7.96	7.96	0.63	293.4	5.76	88.0	126,479	1.98
34	One (1) steam boiler, identified as EU-97 (worst case fuel)	2.85	3.28	2.21	60.8	28.5	1.12	17.2	31,926	0.39
35	One (1) loading rack, identified as EU-46	-	-	-	-	-	6.69	-		0.05
36	**Subtotal Significant Emission Unit**	**1255**	**1248**	**682**	**80.2**	**350**	**3747**	**569**	**185,560**	**112.7**
37	**Fugitive Emissions**	-	-	-	-	-	**128.2**	-		**0.90**
38	Emergency Generator-Diesel	0.280	0.160	0.160	1.62	9.60	0.28	2.20	462	4.41E-03
39	Emergency Generator-Natural gas	0.001	0.001	0.001	1.78E-05	0.10	0.004	0.01	4.29	2.38E-03
40	FW Pump-Diesel	0.13	0.13	0.13	0.12	1.82	0.15	0.39	67.8	1.59E-03
41	**Subtotal Insignificant Activities**	**0.41**	**0.29**	**0.29**	**1.74**	**11.5**	**0.43**	**2.60**	**534**	**8.38E-03**
42	**Total**	**1256**	**1248**	**682**	**82.0**	**361**	**3,875**	**572**	**186,094**	**113.6**
43										
44										

	A	B	C	D	E	F	G	H	I	J
45	**Potential to Emit After Controls (ton/yr)**									
46	***Significant Emission Units***	**PM**	**PM10**	**PM2.5**	**SO2**	**NOx**	**VOC**	**CO**	**GHG**	**Total HAPs**
47		(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
48	***Project-affected emission sources***									
49	Proposed direct-fired DDG dryer (Proposed EU-39)	8.38	8.38	8.38	18.8	27.9	8.38	46.4	27,155	1.18
50	DDG Cooler and Transport System (EU-32)	7.91	5.01	2.01	-	-	9.16	-	-	1.28
51	Wet Cake Production, Storage, and Loadout (Proposed EU-40)	-	-	-	-	-	0.05	-	-	0.0022
52	Steam Tube Dryers (EU-32) Serving as Back-up	29.0	29.0	29.0	-	-	860.5	-	-	67.4
53	***Emission Units not affected (no change from prior permit representations)***									
54	One (1) pneumatic conveyor, identified as EU-11	1.89	1.89	0.32	-	-	-	-	-	-
55	One (1) corn receiving and storage system, identified as EU-12 (Stack S-111)	2.25	2.25	0.38	-	-	-	-	-	-
56	One (1) grain transport system, identified as EU-12 (Stack S-112)	0.20	0.20	0.03	-	-	-	-	-	-
57	Seven (7) storage bins, collectively identified as EU-13	0.20	0.20	0.03	-	-	-	-	-	-
58	Six (6) hammermills, collectively identified as EU-14	0.90	0.90	0.15	-	-	-	-	-	-
59	EU-21, which consists of fourteen (14) open fermenters	-	-	-	-	-	7.8	-	-	0.04
60	DDGS Storage (EU-34)	0.30	0.30	0.05	-	-	-	-	-	-
61	DDGS Rail/Truck Loadout (EU-35/EU-36)	0.27	0.27	0.05	-	-	-	-	-	-
62	DDGS Rail/Truck Loader(EU-37/EU-38)	0.27	0.27	0.05	-	-	-	-	-	-
63	Twenty-four (24) closed fermenters, collectively identified as EU-22	-	-	-	-	-	57.8	-	-	0.26
64	Two (2) beer wells, identified as EU-23 and EU-24	-	-	-	-	-	12.5		-	
65	Distillation (EU-20 and EU-25 through EU-29)	-	-	-	-	-	0.1	-	-	3.43E-03
66	Four (4) paddle screens, identified as EU-31 and three (3) conveyors, identified as EU-33	-	-	-	-	-	440.0	-	-	2.00
67	One (1) wine room, identified as EU-41	-	-	-	-	-	19.5	-	-	-
68	One (1) tank farm, identified as EU-42	-	-	-	-	-	19.0	-	-	-
69	EU-43, which consists of Building 88	-	-	-	-	-	4.69	-	-	-
70	One (1) mini-tank farm, identified as EU-45	-	-	-	-	-	3.59	-	-	-
71	One (1) barrel and emptying operation, identified as EU-61	-	-	-	-	-	12.0	-	-	-
72	Six (6) warehouses, identified as EU-71 through EU-76	-	-	-	-	-	1867	-	-	-
73	One (1) steam boiler, identified as EU-96	1.99	7.96	7.96	0.63	293.4	5.76	88.0	126,479	1.98
74	One (1) steam boiler, identified as EU-97 (worst case fuel)	2.85	3.28	2.21	60.8	28.53	1.12	17.2	31,926	0.39
75	One (1) loading rack, identified as EU-46	-	-	-	-	-	6.69	-		0.05
76	**Subtotal Significant Emission Unit**	**56**	**60**	**51**	**80**	**350**	**3,336**	**152**	**185,560**	**74.55**
77	**Fugitive Emissions**	**-**	**-**	**-**	**-**	**-**	**128.2**	**-**		**0.90**
78	Emergency Generator-Diesel	0.28	0.16	0.16	1.62	9.60	0.28	2.20	462	4.41E-03
79	Emergency Generator-Natural gas	0.001	0.001	0.001	0.00002	0.096	0.004	0.012	4.29	2.38E-03
80	FW Pump-Diesel	0.13	0.13	0.13	0.12	1.82	0.15	0.39	67.8	1.59E-03
81	**Subtotal Insignificant Activities**	**0.41**	**0.29**	**0.29**	**1.74**	**11.52**	**0.43**	**2.60**	**534**	**8.38E-03**
82	**Total**	**56.9**	**60.3**	**51.0**	**82.0**	**361**	**3,465**	**154**	**186,094**	**75.46**
83										

	A	B	C	D	E	F	G	H	I	J
84										
85	**Potential to Emit After Issuance of Permit (Limited PTE) (ton/yr)**									
86	***Significant Emission Units***	**PM**	**PM10**	**PM2.5**	**SO2**	**NOx**	**VOC**	**CO**	**GHG**	**Total HAPs**
87		(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
88	***Project-affected emission sources***									
89	Proposed direct-fired DDG dryer (Proposed EU-39)	8.38	8.38	8.38	18.8	27.9	8.38	46.4	27,155	1.18
90	DDG Cooler and Transport System (EU-32)	7.91	5.01	2.01	-	-	9.16	-	-	1.28
91	Wet Cake Production, Storage, and Loadout (Proposed EU-40)	-	-	-	-	-	0.05	-	-	0.0022
92	Steam Tube Dryers (EU-32) Serving as Back-up	19.8	19.8	19.8	-	-	587.9	-	-	46.0
93	***Emission Units not affected (no change from prior permit representations)***									
94	One (1) pneumatic conveyor, identified as EU-11	189.2	189.2	16.1	-	-	-	-	-	-
95	One (1) corn receiving and storage system, identified as EU-12 (Stack S-111)	5.26	5.26	5.26	-	-	-	-	-	-
96	One (1) grain transport system, identified as EU-12 (Stack S-112)	0.96	0.96	0.96	-	-	-	-	-	-
97	Seven (7) storage bins, collectively identified as EU-13	0.20	0.20	0.03	-	-	-	-	-	-
98	Six (6) hammermills, collectively identified as EU-14	90.1	90.1	7.66	-	-	-	-	-	-
99	EU-21, which consists of fourteen (14) open fermenters	-	-	-	-	-	7.8	-	-	0.04
100	DDGS Storage (EU-34)	0.60	0.60	0.60	-	-	-	-	-	-
101	DDGS Rail/Truck Loadout (EU-35/EU-36)	1.27	1.27	1.27	-	-	-	-	-	-
102	DDGS Rail/Truck Loader(EU-37/EU-38)	5.48	5.48	5.48	-	-	-	-	-	-
103	Twenty-four (24) closed fermenters, collectively identified as EU-22	-	-	-	-	-	57.8	-	-	0.26
104	Two (2) beer wells, identified as EU-23 and EU-24	-	-	-	-	-	12.5	-	-	-
105	Distillation (EU-20 and EU-25 through EU-29)	-	-	-	-	-	0.1	-	-	0.00
106	Four (4) paddle screens, identified as EU-31 and three (3) conveyors, identified as EU-33	-	-	-	-	-	440.0	-	-	2.00
107	One (1) wine room, identified as EU-41	-	-	-	-	-	19.5	-	-	-
108	One (1) tank farm, identified as EU-42	-	-	-	-	-	19.0	-	-	-
109	EU-43, which consists of Building 88	-	-	-	-	-	4.69	-	-	-
110	One (1) mini-tank farm, identified as EU-45	-	-	-	-	-	3.59	-	-	-
111	One (1) barrel and emptying operation, identified as EU-61	-	-	-	-	-	12.0	-	-	-
112	Six (6) warehouses, identified as EU-71 through EU-76	-	-	-	-	-	1,867	-	-	-
113	One (1) steam boiler, identified as EU-96	1.99	7.96	7.96	0.63	293.4	5.76	88.0	126,479	1.98
114	One (1) steam boiler, identified as EU-97 (worst case fuel)	1.98	2.65	1.96	39.4	25.4	0.56	10.42	31,926	0.39
115	One (1) loading rack, identified as EU-46	-	-	-	-	-	6.69	-	-	0.05
116	**Subtotal Significant Emission Unit**	**333**	**337**	**77.5**	**58.9**	**347**	**3,063**	**145**	**185,560**	**53.21**
117	**Fugitive Emissions**	**-**	**-**	**-**	**-**	**-**	**128.2**	**-**	**-**	**0.90**
118	Emergency Generator-Diesel	0.28	0.16	0.16	1.62	9.60	0.28	2.20	462	4.41E-03
119	Emergency Generator-Natural gas	0.001	0.001	0.001	0.000	0.096	0.004	0.012	4.29	2.38E-03
120	FW Pump-Diesel	0.13	0.13	0.13	0.12	1.82	0.15	0.39	67.8	1.59E-03
121	**Subtotal Insignificant Activities**	**0.41**	**0.29**	**0.29**	**1.74**	**11.52**	**0.43**	**2.60**	**534**	**8.38E-03**
122	**Total**	**334**	**337**	**77.8**	**60.6**	**358**	**3,192**	**147**	**186,094**	**54.11**

Table 2
PSD/NNSR Applicability Analysis
Proposed DDG Dryer Project
MGPI of Indiana, LLC

Pollutant	Project Related Emission Increase (tpy)	PSD/NNSR Significance Threshold (tpy)	Netting Analysis Required? (Yes/No)	Net Emissions Increase/Decrease (tpy)	Major Modification? (Yes/ No)
PM	16.29	25	No	N/A	No
PM10	13.38	15	No	N/A	No
PM2.5	10.39	10	Yes	9.19	No
SO2	18.84	40	No	N/A	No
CO	46.43	100	No	N/A	No
NOx	27.86	40	No	N/A	No
VOC	17.58	40	No	N/A	No

Notes:
See Appendix D for constituent-specific tables presenting PSD/NNSR applicability analysis.

Table 3
Summary of Indiana Fuel Ethanol Plant Dryer VOC Controls
MGPI of Indiana, LLC

No.	Facility*	Permit ID	City, State, Zip	Subject to 326 IAC 8-5-6	Method of Compliance	VOC Control Efficiency Required	Year of Documented Reference	
1	Valero Renewable Fuels Company, LLC (dba Valero Linden)	107-29252	Linden, IN 47955	Yes	TO/HRSG	98%	2014	
2	POET Biorefining- Cloverdale, LLC	133-34343	Cloverdale, IN 46120	Yes	2 RTOs	98%	2014	
3	Green Plains Bluffton, LLC	179-34356	Bluffton, IN 46714	Yes	2 RTOs	98%	2014	
4	The Andersons Clymers Ethanol, LLC	017-30272	Logansport, IN 46947	Yes	2 RTO/HRSG Systems	98%	2013	
5	POET Biorefining - Portland	075-30802	Portland, IN 47371	Yes	RTO	98%	2012	
6	POET Biorefining- Alexandria, LLC	095-30443	Alexandria, IN 46001	Yes	RTO	98%	2009	Was issued a FESOP revocation in 2012 since they transitioned from FESOP to Title V
7	POET Biorefining North Manchester	169-27641	North Manchester, IN 46962	Yes	2 RTOs	98%	2010	
8	Cardinal Ethanol, LLC	135-27068	Union City, IN 47390	Yes	2 TO/HRSG Systems	98%	2008	
9	Indiana Biofuels, Inc.	145-24857	Shelbyville, IN 46176	Yes	1 TO per Dryer	98%	2007	
10	Noble Americas South Bend Ethanol LLC	141-34359	South Bend, IN 46613	Yes	1 RTO per Dryer	98%	2014	

Notes:
* - The above facilities each have a 2869 SIC code (Chemicals and Allied Products) and a thermal oxidizer for control of VOC emissions from the DDG dryers
HRSG - Heat Recovery Steam Generator
IAC - Indiana Administrative Code
RTO - Regenerative Thermal Oxidizer

Table C-1
DDG Dryer Process & Combustion Emission Estimates
Criteria Pollutants
MGPI of Indiana, LLC

Combustion Source	**Hourly MMBtu/hr**	**Annual MMBtu/yr**
Direct-fired Dryer Heat Input Capacity[a]	45	394,200
RTO Heat Input Capacity[a]	8	70,080
Total Heat Input Capacity	53	464,280

Production Capacity	**ton/hr**	**ton/yr**
Short-term Distiller's Dry Grain (DDG) Production[b]	9.56	83,754

	Pollutant	Control Efficiency
Control Efficiency For Criteria Emissions (% Removal)[c]	SO_2	0%
	VOC	98%
	CO	90%
	$PM/PM_{10}/PM_{2.5}$	98%

Emissions From DDG Drying (Proposed EU-39)	**Pollutant**	**NOx**		**CO**		**SO_2**		**VOC**		**PM**		**PM_{10}**		**$PM_{2.5}$**	
	Emission Factor[c]	**0.12 lbs/mmbtu**		**2.0 lbs/mmbtu**		**0.45 lbs/ton DDG**		**10.0 lbs/ton DDG**		**10.0 lbs/ton DDG**		**10.0 lbs/ton DDG**		**10.0 lbs/ton DDG**	
	Controlled Emission Factor[c]	**0.12 lbs/mmbtu**		**0.2 lbs/mmbtu**		**0.45 lbs/ton DDGS**		**0.2 lbs/ton DDGS**		**0.2 lbs/ton DDGS**		**0.2 lbs/ton DDGS**		**0.2 lbs/ton DDGS**	
	Units	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**
Uncontrolled PTE[d]		6.36	27.9	106.0	464.3	4.30	18.8	95.61	418.8	95.61	418.8	95.61	418.8	95.61	418.8
Controlled PTE[d]		6.36	27.9	10.6	46.4	4.30	18.8	1.91	8.38	1.91	8.38	1.91	8.38	1.91	8.38

Conversion factor : $\frac{1}{2,000}$ $\frac{\text{ton}}{\text{lbs}}$

Notes:

(a) Design heat inputs of direct fired dryer and of thermal oxidizer provided by the manufacturer (ICM, Inc.).

(b) Maximum short-term distiller's dry grain (DDG) production rate taken from the material balance provided by ICM dated 1/30/2015. Capacity of proposed system will be equivalent to combined capacity of the existing steam-tube dryers (portion of existing EU-32). Material balance is as follows:

	(lb/hr)	%solids
Dryer feed	49,122	#REF!
Water / Evaporation	30,000	0%
DDG Production	19,122	#REF!

Annual operations assume that the proposed dryer will operate at capacity continuously throughout the year.

(c) Dryer uncontrolled emission factors and cyclone/thermal oxidizer control efficiencies provided by the manufacturer (ICM, Inc.). Assume PM/PM_{10} emissions are equivalent. Under the Part

(d) Methodology and Sample Calculations:

NOx and CO:

Uncontrolled PTE (lb/hr) = [Uncontrolled Emission Factor (lb/MMBtu) x Design Firing Rate (MMBtu/hr)]

Uncontrolled PTE (ton/yr) = [Uncontrolled Emission Factor (lb/MMBtu) x Design Firing Rate (MMBtu/yr) / 2,000 lb/ton]

$$\frac{2\text{ lb CO}}{\text{MMBtu}} \; \frac{53\text{ MMBtu}}{\text{hr}} = 106 \; \frac{\text{lb CO}}{\text{hr}}$$

$$\frac{2\text{ lb CO}}{\text{MMBtu}} \; \frac{464{,}280\text{ MMBtu}}{\text{yr}} \; \frac{\text{ton}}{2{,}000\text{ lb}} = 464.3 \; \frac{\text{ton CO}}{\text{yr}}$$

Controlled PTE (lb/hr) = [Uncontrolled Emission Rate (lb/hr) x (1 - Control Efficiency)]

Controlled PTE (ton/yr) = [Uncontrolled Emission Rate (ton/yr) x (1-Control Efficiency)]

$$\frac{106\text{ lb CO}}{\text{hr}} \; (1 - 0.9) = 10.6 \; \frac{\text{lb CO}}{\text{hr}}$$

$$\frac{464.28\text{ ton CO}}{\text{yr}} \; (1 - 0.9) = 46.4 \; \frac{\text{ton CO}}{\text{yr}}$$

SO2, VOC, PM/PM10/PM2.5:

Uncontrolled PTE (lb/hr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/hr)]

Uncontrolled PTE (ton/yr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/yr) / 2,000 lb/ton]

$$\frac{10.0\text{ lb VOC}}{\text{ton DDG}} \; \frac{9.6\text{ ton}}{\text{hr}} = 95.6 \; \frac{\text{lb VOC}}{\text{hr}}$$

$$\frac{10.0\text{ lb VOC}}{\text{ton DDG}} \; \frac{83754.4\text{ ton}}{\text{yr}} \; \frac{\text{ton}}{2{,}000\text{ lb}} = 418.8 \; \frac{\text{ton VOC}}{\text{yr}}$$

Controlled PTE (lb/hr) = [Uncontrolled Emission Rate (lb/hr) x (1 - Control Efficiency)]

Controlled PTE (ton/yr) = [Uncontrolled Emission Rate (ton/yr) x (1-Control Efficiency)]

$$\frac{95.6\text{ lb VOC}}{\text{hr}} \; (1 - 0.98) = 1.9 \; \frac{\text{lb VOC}}{\text{hr}}$$

$$\frac{418.8\text{ ton VOC}}{\text{yr}} \; (1 - 0.98) = 8.4 \; \frac{\text{ton VOC}}{\text{yr}}$$

Do not include in printed area:

Process Weight Rate: #REF! lb/hr feed into dryer
#REF! ton/hr

E = 4.10 P ^0.67
E = #REF! lb/hr emission limit
Dryer meets limit? **#REF!**

Cell: E16
Comment: Mike Wieczorek:
VOC and CO percent reductions: 11/20/14 e-mail from Munim H.

Table C-2
DDG Dryer Process & Combustion Emission Estimates
Hazardous Air Pollutants
MGPI of Indiana, LLC

Combustion Source	Hourly MMBtu/hr	Annual MMBtu/yr
Direct-fired Dryer Heat Input Capacity[(a)]	45	394,200
RTO Heat Input Capacity[(a)]	8	70,080
Total Heat Input Capacity	53	464,280

Production Capacity	ton/hr	ton/yr
Short-term Distiller's Dry Grain (DDG) Production[(b)]	9.56	83,754

Control Efficiency For Criteria Emissions (% Removal)[(c)]	Pollutant	Control Efficiency
	HAP	97%

Description	Design Rate (MMBTU/hr)	Heat Content (Btu/scf)	Fuel Use (scf/hr)	Fuel Use (MMscf/year)
Direct-fired Dryer	45	1,020	44,118	386.5
Thermal Oxidizer Unit	8	1,020	7,843	68.7
		Total	51,961	455.2

HAP Emissions From DDG Drying (EU-39)	Pollutant	Acetaldehyde		Formaldehyde		Acrolein		Methanol		(from Natural Gas		Total HAP Emissions[(e)]	
	Uncontrolled Emission Factors[(c)]	0.5		0.31		0.01		0.11		1.81			
		lbs/ton DDGS		lbs/ton DDGS		lbs/ton DDGS		lbs/ton DDGS		lb/mmscf			
	Units	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
Uncontrolled PTE[(f)]		4.78	20.94	2.96	12.98	0.10	0.42	1.05	4.61	0.09	0.41	8.99	39.36
Controlled PTE[(f)]		0.14	0.63	0.09	0.39	0.003	0.013	0.03	0.14	0.003	0.01	0.27	1.18

Conversion factor : $\frac{1}{2,000}$ $\frac{\text{ton}}{\text{lbs}}$

Notes:

(a) Design heat inputs of direct fired dryer and of thermal oxidizer provided by the manufacturer (ICM, Inc.).
(b) DDG production rates as shown in Table C-1.

(c) Dryer uncontrolled emission factors and thermal oxidizer control efficiencies provided by the manufacturer (ICM, Inc.). Emission factors for specific HAPs include both process emissions from the DDG

(d) HAP emission factors from natural gas combustion are taken from AP-42, Chapter 1.4, as listed below.

Pollutant	Natural Gas Emission Factor (lbs/MMscf)	
Arsenic Compounds	0.0002	
Benzene (71432)	0.0021	
Beryllium Compounds	0.000012	
Cadmium Compounds	0.0011	
Chromium Compounds	0.0014	
Cobalt Compounds	0.000084	
Dichlorobenzene (106467)	0.0012	
Formaldehyde (50000)		Included in production-based factor
Hexane (110543)	1.8	
Lead Compounds	0.0005	
Manganese Compounds	0.00038	
Mercury Compounds	0.00026	
Naphthalene (91203)	0.00061	
Nickel Compounds	0.0021	
Polycyclic Organic Matter	0.0000882	
Selenium Compounds	0.000024	
Toluene (108883)	0.0034	
Total HAPs	1.81	

(e) Total HAP emissions are the sum of Acetaldehyde, Formaldehyde, Acrolein, and Methanol from production and natural gas combustion combined with the sum of HAP emissions from natural gas combustion
(f) Methodology and Sample Calculations, HAP from production and natural gas combustion:
Uncontrolled PTE (lb/hr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/hr)]
Uncontrolled PTE (ton/yr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/yr) / 2,000 lb/ton]

$\frac{0.11 \text{ lb Methanol}}{\text{ton DDG}} \Big| \frac{9.56 \text{ ton}}{\text{hr}} = 1.05 \ \frac{\text{lb Methanol}}{\text{hr}}$

$\frac{0.11 \text{ lb Methanol}}{\text{ton DDG}} \Big| \frac{83,754 \text{ ton}}{\text{yr}} \Big| \frac{\text{ton}}{2,000 \text{ lb}} = 4.61 \ \frac{\text{ton Methanol}}{\text{yr}}$

Controlled PTE (lb/hr) = [Uncontrolled Emission Rate (lb/hr) x (1 - Control Efficiency)]
Controlled PTE (ton/yr) = [Uncontrolled Emission Rate (ton/yr) x (1-Control Efficiency)]

$\frac{1.05 \text{ lb Methanol}}{\text{hr}} \Big| (1 - 0.97) = 0.03 \ \frac{\text{lb Methanol}}{\text{hr}}$

$\frac{4.61 \text{ ton Methanol}}{\text{yr}} \Big| (1 - 0.97) = 0.14 \ \frac{\text{ton Methanol}}{\text{yr}}$

Methodology and Sample Calculations, HAP natural gas combustion only:
Uncontrolled emissions:

$\frac{51,961 \text{ scf}}{\text{hr}} \Big| \frac{1.81 \text{ lb HAP}}{\text{MMscf}} \Big| \frac{\text{MMscf}}{10^6 \text{ scf}} = 0.09 \ \frac{\text{lb HAP}}{\text{hr}}$

$\frac{455 \text{ MMscf}}{\text{yr}} \Big| \frac{1.81 \text{ lb HAP}}{\text{MMscf}} \Big| \frac{\text{ton}}{2,000 \text{ lb}} = 0.41 \ \frac{\text{ton HAP}}{\text{yr}}$

Controlled emissions:

$\frac{0.09 \text{ lb HAP}}{\text{hr}} \Big| (1 - 0.97) = 0.003 \ \frac{\text{lb HAP}}{\text{hr}}$

$\frac{0.41 \text{ ton HAP}}{\text{yr}} \Big| (1 - 0.97) = 0.01 \ \frac{\text{ton HAP}}{\text{yr}}$

Do not include in printed area
BACT form 01 Section G - "Environmental Impact Analysis" requires the calculation of "Toxics Impact" in amount per ton. The guidance at the bottom of the form states " ** Indicate whether air toxics are generated or eliminated due to the implementation of the BACT option. Quantify the

Air Toxics Generated (amount/tor = $\frac{\text{(HAP emissions before control) - (HAP emissions after control)}}{\text{(VOC emissions before control) - (VOC emissions after control)}}$

= 0.093026539

Table C-3
DDG Dryer Process & Combustion Emission Estimates
Greenhouse Gases
MGPI of Indiana, LLC

Description	Design Rate (MMBTU/hr)	Heat Content (Btu/scf)	Fuel Use (scf/hr)	Hours[b] (hr/yr)	Fuel Use (MMscf/year)
Thermal Oxidizer Unit[a]	8	1,020	7,843	8,760	68.7
Direct-fired Dryer[a]	45	1,020	44,118	8,760	386.5
Total					**455.2**

GHG Emission Factors[c]		
CO_2	CH_4	N_2O
(lb/MMscf)	(lb/MMscf)	(lb/MMscf)
119,193	2.2	0.22

Maximum Hourly Emissions[d] (lb/hr)				
	CO_2	CH_4	N_2O	CO_2(e)
Thermal Oxidizer Unit	934.8	0.02	0.002	936
Direct-fired Dryer	5,258.5	0.10	0.010	5,264
Total GHG Emissions	**--**	**--**	**--**	**6,200**

Maximum Annual Emissions[d] (tons/year)				
	CO_2	CH_4	N_2O	CO_2(e)
Thermal Oxidizer Unit	4,095	0.08	0.01	4,099
Direct-fired Dryer	23,032	0.43	0.04	23,056
Total GHG Emissions	**--**	**--**	**--**	**27,155**

Notes:
(a) Design heat inputs of direct fired dryer and of thermal oxidizer provided by the manufacturer (ICM, Inc.).
(b) Operating schedule based on unit operation 24 hours a day, 7 days a week, 52 weeks a year.

(c) Greenhouse gas emission factors taken from Table C-1 and Table C-2 of 40 CFR 98. CO_2e emissions are calculated by applying the global warming potential of each GHG [11/29/13 Federal GWPs, 78FR71950] to its mass emissions.

CO_2	CH_4	N_2O	Units
53.02	1.00E-03	1.00E-04	kg/MMBtu
1	25	298	Global Warming Potential

(d) Methodology and Sample calculations:
Thermal Oxidizer:
Maximum CO_2 emissions (lb/hr) = Fuel flow rate (scf/hr) x Emission Factor (lb/MMscf) x MMscf/10^6 scf)
Maximum CO_2 emissions (ton/yr) = Fuel flow rate (MMscf/yr) x Emission Factor (lb/MMscf) x ton/2,000 lb

7,843 scf / hr	119,193 lb / MMscf	MMscf / 10^6 scf	=	934.85 lb CO_2 / hr
68.7 MMscf / yr	119,193 lb / MMscf	ton / 2,000 lb	=	4,095 ton CO_2 / yr

CO_2e emissions (lb/hr) = CO_2 emissions (lb/hr) + (CH_4 emissions (lb/hr) X CH_4 GWP) + (N_2O emissions (lb/hr) X N_2O GWP)
CO_2e emissions (ton/yr) = CO_2 emissions (ton/yr) + (CH_4 emissions (ton/yr) X CH_4 GWP) + (N_2O emissions (ton/yr) X N_2O GWP)

4,095 ton/yr CO2 + (0.08 ton/yr CH4 x 25) + (0.01 ton/yr N2O x 298) = 4,099 ton/yr CO_2e

Table C-4
DDG Cooler and Transport System Emission Estimates
Particulate
MGPI of Indiana, LLC

Uncontrolled Emissions Estimates

Emission Unit	Emission Point	Description	Uncontrolled PM Emission Factor (lb/ton)	Uncontrolled PM_{10} Emission Factor (lb/ton)	Uncontrolled $PM_{2.5}$ Emission Factor (lb/ton)	Source[(a)]	DDG throughput[(c)] (ton/hr)	DDG throughput[(c)] (ton/yr)	Uncontrolled PM Emission Rate[(d)] (lb/hr)	Uncontrolled PM Emission Rate[(d)] (ton/yr)	Uncontrolled PM_{10} Emission Rate[(d)] (lb/hr)	Uncontrolled PM_{10} Emission Rate[(d)] (ton/yr)	Uncontrolled $PM_{2.5}$ Emission Rate[(d)] (lb/hr)	Uncontrolled $PM_{2.5}$ Emission Rate[(d)] (ton/yr)
EU-32	Screw Conveyor	Grain Conveying	0.061	0.034	0.0058	AP-42, Table 9.9.1-1 (3/03), Headhouse and Grain Handling	9.56	83,754	0.58	2.55	0.33	1.42	0.06	0.24
	Hammer Mill	Hammer Milling[(b)]	0.793	0.484	0.182	AP-42, Table 9.9.1-2 (3/03), Animal Feed Mills, Hammermill			7.58	33.20	4.62	20.25	1.74	7.64
	Drum Cooler	Grain Conveying	0.061	0.034	0.0058	AP-42, Table 9.9.1-1 (3/03), Headhouse and Grain Handling			0.58	2.55	0.33	1.42	0.06	0.24
								Totals	**8.16**	**35.76**	**4.95**	**21.68**	**1.80**	**7.88**

Controlled Emissions Estimates

Emission Unit	Emission Point	Description	Controlled PM Emission Factor (lb/ton)	Controlled PM_{10} Emission Factor (lb/ton)	Controlled $PM_{2.5}$ Emission Factor (lb/ton)	Source[(a)]	DDG throughput[(c)] (ton/hr)	DDG throughput[(c)] (ton/yr)	Controlled PM Emission Rate[(d)] (lb/hr)	Controlled PM Emission Rate[(d)] (ton/yr)	Controlled PM_{10} Emission Rate[(d)] (lb/hr)	Controlled PM_{10} Emission Rate[(d)] (ton/yr)	Controlled $PM_{2.5}$ Emission Rate[(d)] (lb/hr)	Controlled $PM_{2.5}$ Emission Rate[(d)] (ton/yr)
EU-32	Screw Conveyor	Grain Conveying	0.061	0.034	0.0058	AP-42, Table 9.9.1-1 (3/03), Headhouse and Grain Handling	9.56	83,754	0.58	2.55	0.33	1.42	0.06	0.24
	Hammer Mill	Hammer Milling[(b)]	0.067	0.052	0.036	AP-42, Table 9.9.1-2 (3/03), Animal Feed Mills, Hammermill			0.64	2.81	0.49	2.16	0.35	1.53
	Drum Cooler	Grain Conveying	0.061	0.034	0.0058	AP-42, Table 9.9.1-1 (3/03), Headhouse and Grain Handling			0.58	2.55	0.33	1.42	0.06	0.24
								Totals	**1.81**	**7.91**	**1.14**	**5.01**	**0.46**	**2.01**

Notes:

(a) Factors taken from AP-42, Fifth Edition, Volume 1, Section 9.9.1 (Grain Elevators and Processes).
Grain conveying factors assume no control (controlled and uncontrolled factors are equivalent). Controlled milling factor is taken from AP-42, Table 9.9.1-1, which accounts for cyclone controls in place on DDG cooling system. Uncontrolled factor for milling is calculated assuming that the cyclone achieves 85% PM control.

(b) As recommended by AP-42 Appendix B.2, Table B.2.2 for Category 7 - "Grain Processing" on Page 17, the particle size distribution for PM_{10} is 61% of Total PM and for $PM_{2.5}$ is 23% of Total PM for

PM Size Range	Uncontrolled wt%	Collection Efficiency	Controlled Wt	Controlled wt%
$PM_{2.5}$	23%	80%	0.046	54%
$PM_{2.5}$ to PM_{10}	38%	95%	0.019	22%
PM_{10} and higher	39%	95%	0.0195	23%
	1		0.0845	
		Overall control:	91.6%	

(c) Throughputs as listed in Table C-1.

(d) Methodology and Sample Calculations:
Uncontrolled PTE (lb/hr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/hr)]
Uncontrolled PTE (ton/yr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/yr) / 2,000 lb/ton]
Hammer Milling Emissions:

$$\frac{0.05 \text{ lb PM-10}}{\text{ton DDG}} \times \frac{9.561 \text{ ton}}{\text{hr}} = 0.49 \text{ lb PM-10/hr}$$

$$\frac{0.05 \text{ lb PM-10}}{\text{ton DDG}} \times \frac{83{,}754 \text{ ton}}{\text{yr}} \times \frac{\text{ton}}{2{,}000 \text{ lb}} = 2.16 \text{ ton PM-10/yr}$$

Do not include in printed area:
Process Weight Rate:
ton/hr DDG into cooler 9.56

E = 4.10 P ^0.67
lb/hr emission limit E = 18.61
Dryer meets limit? **Yes**

Table C-5
DDG Cooler and Transport System Emission Estimates
Volatile Organic Compounds & Hazardous Air Pollutants
MGPI of Indiana, LLC

Emission Unit	Emission Point	Description	DDG throughput[b]	Uncontrolled Emission Factors[a]	VOC[c] 0.219 lb/ton DDG		Acetaldehyde[c] 0.016 lbs/ton DDG		Acrolein[c] 0.00033 lbs/ton DDG		Formaldehyde[c] 0.010 lbs/ton DDG		Methanol[c] 0.0036 lbs/ton DDG		Total HAP Emissions	
			(ton/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
EU-32	Drum Cooler	Cooling Drum Apparatus	9.56	83,754	2.09	9.16	0.16	0.69	0.0031	0.014	0.10	0.43	0.034	0.15	0.292	1.28
	Existing Screw Conveyor	Grain Conveying														
	Existing Hammer Mill and	Hammer Milling														

Notes:
(a) VOC emission factor for DDG cooling taken from a similar operation permitted in Indiana under Permit #T169-31191-00068 (POET Biorefining - North Manchester). HAP emission factors are derived as a percentage of the VOC emission factor presented, assuming that individual HAPs are emitted in the same proportion from cooling as from the drying emissions provided
(b) DDG throughputs as provided in Table C-1.
(c) Methodology and Sample Calculations:
Emission rate (lb/hr) = DDG Throughput (ton/hr) X DDG Cooling Emission factor (lb/ton)
Emission rate (ton/yr) = DDG Throughput (ton/yr) X DDG Cooling Emission factor (lb/ton) x ton/2,000 lb

$$\frac{9.561 \text{ ton DDG}}{\text{hr}} \quad \frac{0.219 \text{ lb VOC}}{\text{ton DDG}} = \frac{2.09 \text{ lb VOC}}{\text{hr}}$$

$$\frac{83{,}754 \text{ ton DDG}}{\text{yr}} \quad \frac{0.219 \text{ lb VOC}}{\text{ton DDG}} \quad \frac{\text{ton}}{2{,}000 \text{ lb}} = \frac{9.16 \text{ ton VOC}}{\text{yr}}$$

Dryer emissions

	tpy from Drying	% of VOC
VOC	8.375436	--
Acetaldehyde[d]	0.63	7.50%
Acrolein[d]	0.013	0.15%
Formaldehyde[d]	0.39	4.65%
Methanol[d]	0.14	1.65%

Other DDG Cooler Emission Factors

POET Biorefining - N Manchester
5.685 lb VOC/hr — From June 2004 testing at POET-Biorefining Jewell (IA)
26 ton DDG/hr
0.218653846 lb VOC / ton DDG

Valero-Linden
0.023 lb VOC/ton — From Vendor data; based on testing of a similar facility and scaled linearly (2.54 scale factor) to site-specific production

Green Plains Bluffton
0.1 lb VOC/ton

POET Biorefining - Portland

7.3 lb/hr	23,800 scfm	From Feb 2008 stack test at POET-Portland
27 ton DDG/hr	74.5 ppmv as C	
0.27037037 lb VOC/ton DDG	12 lb/lb-mol C	
	2.2 Midwest scaling factor (as C to as EtOH)	
	7.29 lb/hr as EtOH	

POET - Alexandria

5.7 lb VOC/hr	23,800 scfm
27 ton DDG/hr	58.23 ppmv as C
0.211111111 lb VOC/ton DDG	12 lb/lb-mol C
	2.2 Midwest scaling factor (as C to as EtOH)
	5.70 lb/hr as EtOH

Cardinal Ethanol
0.1 lb/ton

Table C-6
Wet Cake Emission Estimates
MGPI of Indiana, LLC

Emission Unit	Emission Point[a]	Uncontrolled Emission Factors[b] Dryer Feed[c] (ton/hr)	Dryer Feed[c] (ton/yr)	0.0083 lb/ton wet cake VOC[d] (lb/hr)	VOC[d] (ton/yr)	0.0001 lb/ton wet cake Acetaldehyde[d] (lb/hr)	Acetaldehyde[d] (ton/yr)	0.00002 lb/ton wet cake Acrolein[d] (lb/hr)	Acrolein[d] (ton/yr)	0.0002 lb/ton wet cake Formaldehyde((lb/hr)	Formaldehyde((ton/yr)	0.00004 lb/ton wet cake Methanol[d] (lb/hr)	Methanol[d] (ton/yr)	Total HAP Emissions (lb/hr)	Total HAP Emissions (ton/yr)
Proposed EU-40	Wet Cake Production, Storage, and Loadout	24.56	12,281	0.20	0.05	0.002	0.0006	0.0005	0.0001	0.005	0.001	0.001	0.0002	0.009	0.0022

Notes:

(a) VOC and HAP emissions can result during periods of dryer start-up and shutdown, when the dryer throughput may be diverted to a wet pad so that wet feed is
(b) Emission factor for wet cake taken from a similar operation permitted in Indiana under Permit #T095-30443-00127 (POET Biorefining - Alexandria).
(c) Hourly dryer feed is maximum as taken from the material balance provided by ICM dated 1/30/2015. Annual feed assumes that wet cake production is limited
(d) Methodology and Sample Calculations:
Emission rate (lb/hr) = Dryer Feed (ton/hr) X Wet Cake Emission factor (lb/ton)
Emission rate (ton/yr) = Dryer Feed (ton/yr) X Wet Cake Emission factor (lb/ton) x ton/2,000 lb

$$\frac{24.56 \text{ ton wet cake}}{\text{hr}} \times \frac{0.0083 \text{ lb VOC}}{\text{ton wet cake}} = 0.20 \ \frac{\text{lb VOC}}{\text{hr}}$$

$$\frac{12{,}281 \text{ ton wet cake}}{\text{yr}} \times \frac{0.008 \text{ lb VOC}}{\text{ton wet cake}} \times \frac{\text{ton}}{2{,}000 \text{ lb}} = 0.05 \ \frac{\text{ton VOC}}{\text{yr}}$$

Table C-7a
Potential to Emit (PTE) From Existing Steam Tube Dryer System
Proposed DDG Dryer Project
MGPI of Indiana, LLC

EU-32 Steam Tube Rotary Dryers, Cooler and Transport System

PM, PM_{10}, $PM_{2.5}$ Emissions

Constituent	Dryer Feed Rate[(a)] (ton/yr)	Controlled Emission Factor[(b)] (lb/ton)	Controlled Emissions[(c)] (ton/yr)	Uncontrolled Emissions[(d)] (ton/yr)
PM	215,154	0.27	29.0	193.6
PM10		0.27	29.0	193.6
PM2.5		0.27	29.0	193.6

Notes:

(a) Feed (wet cake) into existing steam tube dryer system is taken from the material balance provided by ICM dated 1/30/2015. Capacity of existing system and proposed system are equivalent.

(b) Controlled emission Factor from AP-42, Table 9.9.7-1. The emission estimation

(c) Methodology and Sample Calculations:

Controlled Emissions (ton/yr) = Usage (ton/yr) x EF (lb/ton) / 2,000 lb/ton

PM2.5 emissions conservatively assumed to be equal to PM10 emissions.

$$\frac{215{,}154 \text{ ton}}{\text{yr}} \left| \frac{0.27 \text{ lb PM}}{\text{ton}} \right| \frac{\text{ton}}{2{,}000 \text{ lb}} = 29.0 \ \frac{\text{ton PM}}{\text{yr}}$$

(d) Uncontrolled emissions estimated based on an 85% control efficiency for controlled emissions.

$PM_{2.5}$ emissions conservatively assumed to be equal to PM_{10} emissions.

VOC Emissions

Dryer Feed Rate [(a)] (ton/hr)	Water Content[(b)] (% by wt)	VOC Content of Water[(b)] (lb VOC/lb water)	VOC from Dryers (ton/yr)
215,154	66.66%	0.006	860.5

Notes:

(a) Feed (wet cake) into existing steam tube dryer system is taken from the material balance

(b) Water content (% wt) and VOC content of water (lb VOC/lb water)

(c) Methodology and Sample Calculations:

VOC (ton/yr) = Dryer Feed Rate (ton/yr) x Water Content of Feed (% by wt) x (lb VOC/lb water)

$$\frac{215{,}154 \text{ ton}}{\text{yr}} \left| \frac{66.66 \text{ \% wt}}{\text{ton}} \right| \frac{0.006 \text{ lb VOC}}{\text{lb water}} = 860.5 \ \frac{\text{ton VOC}}{\text{yr}}$$

HAP Emissions

	A	B	C	D	E	F	G	H
43	**HAP**		**HAP%[(a)] (by wt of VOC)**	**HAP from Dryers (ton/yr)**				
44	Acetaldehyde		6.18%	53.2				
45	Acrolein		0.37%	3.2				
46	Methanol		1.24%	10.7				
47	Formaldehyde		0.04%	0.3				
48	Total			67.4				
49								
50	Notes:							
51	(a)	HAP composition taken from May 22, 2014 ATSD, Appendix A, Page 8 of 23, for permit T029-						

Table C-7b
Emissions From Existing Steam Tube Dryer System - as Backup
Proposed DDG Dryer Project
MGPI of Indiana, LLC

EU-32 Steam Tube Rotary Dryers, Cooler and Transport System

PM, PM_{10}, $PM_{2.5}$ Emissions

Constituent	Dryer Feed Rate[a] (ton/yr)	Controlled Emission Factor[b] (lb/ton)	Controlled Emissions[c] (ton/yr)	Uncontrolled Emissions[d] (ton/yr)
PM	147,000	0.27	19.8	132.3
PM10		0.27	19.8	132.3
PM2.5		0.27	19.8	132.3

Notes:

(a) Feed (wet cake) into existing steam tube dryer system is based on operation as back-up to the proposed direct-fired dryer. MGPI proposes to limit the throughput of the steam tube dryers since the units will operate as back-up to the proposed new direct-fired unit.

(b) Controlled emission Factor from AP-42, Table 9.9.7-1. The emission estimation

(c) Methodology and Sample Calculations:

Controlled Emissions (ton/yr) = Usage (ton/yr) x EF (lb/ton) / 2,000 lb/ton

PM2.5 emissions conservatively assumed to be equal to PM10 emissions.

$$\frac{147{,}000 \text{ ton}}{\text{yr}} \; \frac{0.27 \text{ lb PM}}{\text{ton}} \; \frac{\text{ton}}{2{,}000 \text{ lb}} = 19.8 \; \frac{\text{ton PM}}{\text{yr}}$$

(d) Uncontrolled emissions estimated based on an 85% control efficiency for controlled emissions.

$PM_{2.5}$ emissions conservatively assumed to be equal to PM_{10} emissions.

VOC Emissions

Dryer Feed Rate (ton/hr)	Water Content[b] (% by wt)	VOC Content of Water[b] (lb VOC/lb water)	VOC from Dryers (ton/yr)
147,000	66.66%	0.006	587.9

Notes:

(a) Feed (wet cake) into existing steam tube dryer system is based on

(b) Water content (% wt) and VOC content of water (lb VOC/lb water)

(c) Methodology and Sample Calculations:

VOC (ton/yr) = Dryer Feed Rate (ton/yr) x Water Content of Feed (% by wt) x (lb VOC/lb water)

$$\frac{147{,}000 \text{ ton}}{\text{yr}} \; \frac{66.66 \text{ \% wt}}{\text{ton}} \; \frac{0.006 \text{ lb VOC}}{\text{lb water}} = 587.9 \; \frac{\text{ton VOC}}{\text{yr}}$$

HAP Emissions

	A	B	C	D	E	F	G	H
43	**HAP**		**HAP%[(a)] (by wt of VOC)**	**HAP from Dryers (ton/yr)**				
44	Acetaldehyde		6.18%	36.3				
45	Acrolein		0.37%	2.2				
46	Methanol		1.24%	7.3				
47	Formaldehyde		0.04%	0.2				
48	Total			46.0				
49								
50	Notes:							
51	(a)	HAP composition taken from May 22, 2014 ATSD, Appendix A, Page 8 of 23, for permit T029-						

Table D-1
Project-Related PM Emission Changes
Proposed DDG Dryer Project
MGPI of Indiana, LLC

Source	Baseline or Past Actual Emissions (tpy)[(a)]	Post-Project Emissions (tpy) [(b)]	Project-Related Emissions Increase/Decrease (tpy)[(c)]
Proposed direct-fired DDG dryer (Proposed EU-39)	0	8.38	8.38
DDG Cooler and Transport System (portion of EU-32)	0	7.91	7.91
Existing Steam Tube Dryers	21.45	19.85	-1.61
		Project-Related Increases:	16.29
		Significance Threshold:	25
		Significant Emissions Increase?	NO

Notes:

(a) Past actual emissions for the proposed direct-fired DDG dryer are zero since the unit will be newly constructed. The existing DDG cooler and transport system (portion of EU-32) will continue to be used downstream of the direct-fired DDG dryer. However, emissions from these operations have not historically been separately quantified from existing steam tube dryer emissions. Therefore the cooler and transport baseline emissions are conservatively set to zero as well.

(b) See Table C-1 for post-project emission rates from the proposed direct-fired DDG Dryer. See Table C-4 for post-project emission rates from the Cooler and

(c) Project-Related Emissions Increase/Decrease = Future Projected Actual or Permitted Emissions - Past Actual Emissions

(d) The existing steam tube DDG dryers (portion of EU-32) will be converted to use as a back-up system for the proposed direct-fired DDG dryer, but will not be

Do not include with application

Contemporaneous Emission Changes - Netting Analysis

Project Name/Description	Actual Emissions Before the Change (tpy)	Potential Emissions After the Change (tpy)	Change (Increase or Decrease) (tpy)	Creditable Increase or Decrease (tpy)
Proposed Project Increases	0	16.29	16.29	16.29
Proposed Project Decreases[(e)]	21.45	19.85	-1.61	-1.61
Creditable Contemporaneous Increases/Decreases [(f,g)]				
Permit 029-32386-00005 (12/17/12)	-		0.10	0.10
			Total Contemporaneous Net Emissions Change	14.78
			Significance Threshold:	25
			Significant Net Emissions Increase?	NO

(e) Project related emission decreases are associated with the conversion of the existing steam tube Dryers (included with existing EU-32 to "backup status").

(f) The Creditable Contemporaneous Increases/Decreases were determined based on historical projects conducted at MGP of Indiana's Lawrenceburg, IN over

(g) The historical projects conducted at MGPI's Lawrenceburg, IN facility over the preceding 5-year period include the following:

Table D-2
Project-Related PM_{10} Emission Changes
Proposed DDG Dryer Project
MGPI of Indiana, LLC

Source	Baseline or Past Actual Emissions (tpy)[(a)]	Post-Project Emissions (tpy) [(b)]	Project-Related Emissions Increase/Decrease (tpy)[(c)]
Proposed direct-fired DDG dryer (Proposed EU-39)	0	8.38	8.38
DDG Cooler and Transport System (portion of EU-32)	0	5.01	5.01
Existing Steam Tube Dryers	21.45	19.85	-1.61
		Project-Related Increases:	13.38
		Significance Threshold:	15
		Significant Emissions Increase?	NO

Notes:

(a) Past actual emissions for the proposed direct-fired DDG dryer are zero since the unit will be newly constructed. The existing DDG cooler and transport system (portion of EU-32) will continue to be used downstream of the direct-fired DDG dryer. However, emissions from these operations have not historically been separately quantified from existing steam tube dryer emissions. Therefore the cooler and transport baseline emissions are conservatively set to zero as well.

(b) See Table C-1 for post-project emission rates from the proposed direct-fired DDG Dryer. See Table C-4 for post-project emission rates from the Cooler and

(c) Project-Related Emissions Increase/Decrease = Future Projected Actual or Permitted Emissions - Past Actual Emissions

(d) The existing steam tube DDG dryers (portion of EU-32) will be converted to use as a back-up system for the proposed direct-fired DDG dryer, but will not be

Do not include with application

Contemporaneous Emission Changes - Netting Analysis

Project Name/Description	Actual Emissions Before the Change (tpy)	Potential Emissions After the Change (tpy)	Change (Increase or Decrease) (tpy)	Creditable Increase or Decrease (tpy)
Proposed Project Increases	0	13.38	13.38	13.38
Proposed Project Decreases[(e)]	21.45	19.85	-1.61	-1.61
Creditable Contemporaneous Increases/Decreases [(f,g)]				
Permit 029-32386-00005 (12/17/12)	-		0.41	0.41
			Total Contemporaneous Net Emissions Change	12.19
			Significance Threshold:	15
			Significant Net Emissions Increase?	NO

(e) Project related emission decreases are associated with the conversion of the existing steam tube Dryers (included with existing EU-32 to "backup status"). See

(f) The Creditable Contemporaneous Increases/Decreases were determined based on historical projects conducted at MGP of Indiana's Lawrenceburg, IN over the

(g) The historical projects conducted at MGPI's Lawrenceburg, IN facility over the preceding 5-year period include the following:

Table D-3
Project-Related $PM_{2.5}$ Emission Changes
Proposed DDG Dryer Project
MGPI of Indiana, LLC

Source	Baseline or Past Actual Emissions (tpy)[a]	Post-Project Emissions (tpy) [b]	Project-Related Emissions Increase/Decrease (tpy)[c]
Proposed direct-fired DDG dryer (Proposed EU-39)	0	8.38	8.38
DDG Cooler and Transport System (portion of EU-32)	0	2.01	2.01
Existing Steam Tube Dryers	21.45	19.85	-1.61
		Project-Related Increases:	10.39
		Significance Threshold:	10
		Significant Emissions Increase?	YES

Notes:

(a) Past actual emissions for the proposed direct-fired DDG dryer are zero since the unit will be newly constructed. The existing DDG cooler and transport system (portion of EU-32) will continue to be used downstream of the direct-fired DDG dryer. However, emissions from these operations have not historically been separately quantified from existing steam tube dryer emissions. Therefore the cooler and transport baseline emissions are conservatively set to zero as well.

(b) See Table C-1 for post-project emission rates from the proposed direct-fired DDG Dryer. See Table C-4 for post-project emission rates from the Cooler and

(c) Project-Related Emissions Increase/Decrease = Future Projected Actual or Permitted Emissions - Past Actual Emissions

(d) The existing steam tube DDG dryers (portion of EU-32) will be converted to use as a back-up system for the proposed direct-fired DDG dryer, but will not be

Do not include with application

Contemporaneous Emission Changes - Netting Analysis

Project Name/Description	Actual Emissions Before the Change (tpy)	Potential Emissions After the Change (tpy)	Change (Increase or Decrease) (tpy)	Creditable Increase or Decrease (tpy)
Proposed Project Increases	0	10.39	10.39	10.39
Proposed Project Decreases[e]	21.45	19.85	-1.61	-1.61
Creditable Contemporaneous Increases/Decreases [f,g]				
Permit 029-32386-00005 (12/17/12)	-		0.41	0.41
			Total Contemporaneous Net Emissions Change	9.19
			Significance Threshold:	10
			Significant Net Emissions Increase?	NO

(e) Project related emission decreases are associated with the conversion of the existing steam tube Dryers (included with existing EU-32 to "backup status").

(f) The Creditable Contemporaneous Increases/Decreases were determined based on historical projects conducted at MGP of Indiana's Lawrenceburg, IN over

(g) The historical projects conducted at MGPI's Lawrenceburg, IN facility over the preceding 5-year period include the following:

Table D-4
Project-Related VOC Emission Changes
Proposed DDG Dryer Project
MGPI of Indiana, LLC

Source	Baseline or Past Actual Emissions (tpy)[(a)]	Post-Project Emissions (tpy) [(b)]	Project-Related Emissions Increase/Decrease (tpy)[(c)]
Proposed direct-fired DDG dryer (Proposed EU-39)	0	8.38	8.38
DDG Cooler and Transport System (portion of EU-32)	0	9.16	9.16
Wet Cake Production, Storage, and Loadout (Proposed EU-40)	0	0.05	0.05
Existing Steam Tube Dryers	635.51	587.94	-47.57
		Project-Related Increases:	17.58
		Significance Threshold:	40
		Significant Emissions Increase?	NO

Notes:

(a) Past actual emissions for the proposed direct-fired DDG dryer are zero since the unit will be newly constructed. The existing DDG cooler and transport system (portion of EU-32) will continue to be used downstream of the direct-fired DDG dryer. However, emissions from these operations have not historically been separately quantified from existing steam tube dryer emissions. Therefore the cooler and transport baseline emissions are conservatively set to zero as well.

(b) See Table C-1 for post-project emission rates from the proposed direct-fired DDG Dryer. See Table C-5 for post-project emission rates from the Cooler and

(c) Project-Related Emissions Increase/Decrease = Future Projected Actual or Permitted Emissions - Past Actual Emissions

(d) The existing steam tube DDG dryers (portion of EU-32) will be converted to use as a back-up system for the proposed direct-fired DDG dryer, but will not be

<u>Do not include with application</u>

Contemporaneous Emission Changes - Netting Analysis

Project Name/Description	Actual Emissions Before the Change (tpy)	Potential Emissions After the Change (tpy)	Change (Increase or Decrease) (tpy)	Creditable Increase or Decrease (tpy)
Proposed Project Increases	0	17.58	17.58	17.58
Proposed Project Decreases[(e)]	635.51	587.94	-47.57	-47.57
Creditable Contemporaneous Increases/Decreases [(f,g)]				
Permit 029-32119-00005 (5/31/13)	-		2.10	2.10
Permit 029-32386-00005 (12/17/12)	-		0.30	0.30
			Total Contemporaneous Net Emissions Change	-27.59
			Significance Threshold:	40
			Significant Net Emissions Increase?	NO

(e) Project related emission decreases are associated with the conversion of the existing steam tube Dryers (included with existing EU-32 to "backup status"). See

(f) The Creditable Contemporaneous Increases/Decreases were determined based on historical projects conducted at MGP of Indiana's Lawrenceburg, IN over the

(g) The historical projects conducted at MGPI's Lawrenceburg, IN facility over the preceding 5-year period include the following:

Table D-5
Project-Related SO_2 Emission Changes
Proposed DDG Dryer Project
MGPI of Indiana, LLC

Source	Baseline or Past Actual Emissions (tpy)[a]	Post-Project Emissions (tpy)[b]	Project-Related Emissions Increase/Decrease (tpy)[c]
Proposed direct-fired DDG dryer (Proposed EU-39)	0	18.8	18.8
DDG Cooler and Transport System (portion of EU-32)	0	0	0
Existing Steam Tube Dryers	0	0	0
		Project-Related Increases:	18.8
		Significance Threshold:	40
		Significant Emissions Increase?	NO

Notes:

(a) Past actual emissions for the proposed direct-fired DDG dryer are zero since the unit will be newly constructed. The existing DDG cooler and transport system (portion of EU-32) will continue to be used downstream of the direct-fired DDG dryer. However, emissions from these operations have not historically been separately quantified from existing steam tube dryer emissions. Therefore the cooler and transport baseline emissions are conservatively set to zero as well.

(b) See Table C-1 for post-project emission rates from the proposed direct-fired DDG Dryer. See Table C-4 for post-project emission rates from the Cooler and

(c) Project-Related Emissions Increase/Decrease = Future Projected Actual or Permitted Emissions - Past Actual Emissions

(d) The existing steam tube DDG dryers (portion of EU-32) will be converted to use as a back-up system for the proposed direct-fired DDG dryer, but will not be

Do not include with application

Contemporaneous Emission Changes - Netting Analysis

Project Name/Description	Actual Emissions Before the Change (tpy)	Potential Emissions After the Change (tpy)	Change (Increase or Decrease) (tpy)	Creditable Increase or Decrease (tpy)
Proposed Project Increases	0	18.84	18.84	18.84
Proposed Project Decreases[e]	0	0	0	0
Creditable Contemporaneous Increases/Decreases [f,g]				
Permit 029-32386-00005 (12/17/12)	-		0.03	0.03
			Total Contemporaneous Net Emissions Change	18.87
			Significance Threshold:	40
			Significant Net Emissions Increase?	NO

(e) Project related emission decreases are associated with the conversion of the existing steam tube Dryers (included with existing EU-32 to "backup status"). See

(f) The Creditable Contemporaneous Increases/Decreases were determined based on historical projects conducted at MGP of Indiana's Lawrenceburg, IN over the

(g) The historical projects conducted at MGPI's Lawrenceburg, IN facility over the preceding 5-year period include the following:

Table D-6
Project-Related NO_X Emission Changes
Proposed DDG Dryer Project
MGPI of Indiana, LLC

Source	Baseline or Past Actual Emissions (tpy)[(a)]	Post-Project Emissions (tpy) [(b)]	Project-Related Emissions Increase/Decrease (tpy)[(c)]
Proposed direct-fired DDG dryer (Proposed EU-39)	0	27.9	27.9
DDG Cooler and Transport System (portion of EU-32)	0	0	0
Existing Steam Tube Dryers	0	0	0
		Project-Related Increases:	27.9
		Significance Threshold:	40
		Significant Emissions Increase?	NO

Notes:

(a) Past actual emissions for the proposed direct-fired DDG dryer are zero since the unit will be newly constructed. The existing DDG cooler and transport system (portion of EU-32) will continue to be used downstream of the direct-fired DDG dryer. However, emissions from these operations have not historically been separately quantified from existing steam tube dryer emissions. Therefore the cooler and transport baseline emissions are conservatively set to zero as well.

(b) See Table C-1 for post-project emission rates from the proposed direct-fired DDG Dryer. See Table C-4 for post-project emission rates from the Cooler and

(c) Project-Related Emissions Increase/Decrease = Future Projected Actual or Permitted Emissions - Past Actual Emissions

(d) The existing steam tube DDG dryers (portion of EU-32) will be converted to use as a back-up system for the proposed direct-fired DDG dryer, but will not be

Do not include with application

Contemporaneous Emission Changes - Netting Analysis

Project Name/Description	Actual Emissions Before the Change (tpy)	Potential Emissions After the Change (tpy)	Change (Increase or Decrease) (tpy)	Creditable Increase or Decrease (tpy)
Proposed Project Increases	0	27.86	27.86	27.86
Proposed Project Decreases[(e)]	0	0	0	0
Creditable Contemporaneous Increases/Decreases [(f,g)]				
Permit 029-32386-00005 (12/17/12)	-		5.41	5.41
			Total Contemporaneous Net Emissions Change	33.27
			Significance Threshold:	40
			Significant Net Emissions Increase?	NO

(e) Project related emission decreases are associated with the conversion of the existing steam tube Dryers (included with existing EU-32 to "backup status").

(f) The Creditable Contemporaneous Increases/Decreases were determined based on historical projects conducted at MGP of Indiana's Lawrenceburg, IN over

(g) The historical projects conducted at MGPI's Lawrenceburg, IN facility over the preceding 5-year period include the following:

Table D-7
Project-Related CO Emission Changes
Proposed DDG Dryer Project
MGPI of Indiana, LLC

Source	Baseline or Past Actual Emissions (tpy)[a]	Post-Project Emissions (tpy) [b]	Project-Related Emissions Increase/Decrease (tpy)[c]
Proposed direct-fired DDG dryer (Proposed EU-39)	0	46.4	46.4
DDG Cooler and Transport System (portion of EU-32)	0	0	0
Existing Steam Tube Dryers	0	0	0
		Project-Related Increases:	46.4
		Significance Threshold:	100
		Significant Emissions Increase?	NO

Notes:

(a) Past actual emissions for the proposed direct-fired DDG dryer are zero since the unit will be newly constructed. The existing DDG cooler and transport system (portion of EU-32) will continue to be used downstream of the direct-fired DDG dryer. However, emissions from these operations have not historically been separately quantified from existing steam tube dryer emissions. Therefore the cooler and transport baseline emissions are conservatively set to zero as well.

(b) See Table C-1 for post-project emission rates from the proposed direct-fired DDG Dryer. See Table C-4 for post-project emission rates from the Cooler and

(c) Project-Related Emissions Increase/Decrease = Future Projected Actual or Permitted Emissions - Past Actual Emissions

(d) The existing steam tube DDG dryers (portion of EU-32) will be converted to use as a back-up system for the proposed direct-fired DDG dryer, but will not be

Do not include with application

Contemporaneous Emission Changes - Netting Analysis

Project Name/Description	Actual Emissions Before the Change (tpy)	Potential Emissions After the Change (tpy)	Change (Increase or Decrease) (tpy)	Creditable Increase or Decrease (tpy)
Proposed Project Increases	0	46.43	46.43	46.43
Proposed Project Decreases[e]	0	0	0	0
Creditable Contemporaneous Increases/Decreases [f,g]				
Permit 029-32386-00005 (12/17/12)	-		4.54	4.54
			Total Contemporaneous Net Emissions Change	50.97
			Significance Threshold:	100
			Significant Net Emissions Increase?	NO

(e) Project related emission decreases are associated with the conversion of the existing steam tube Dryers (included with existing EU-32 to "backup status"). See

(f) The Creditable Contemporaneous Increases/Decreases were determined based on historical projects conducted at MGP of Indiana's Lawrenceburg, IN over the

(g) The historical projects conducted at MGPI's Lawrenceburg, IN facility over the preceding 5-year period include the following:

Table D-8
Past Actual Emissions From Existing Steam-tube Dryer System
Proposed DDG Dryer Project
MGPI of Indiana, LLC

EU-32 Rotary Dryers, Cooler and Transport System

PM, PM_{10}, $PM_{2.5}$ Emissions

Constituent	Dryer Feed Rate[a] (ton/yr)	Controlled Emission Factor[b] (lb/ton)	Controlled Emissions[c] (ton/yr)
PM	158,894	0.27	21.5
PM10		0.27	21.5
PM2.5		0.27	21.5

Notes:

(a) Feed (wet cake) into existing steam tube dryer system is taken from

(b) Controlled emission Factor from AP-42, Table 9.9.7-1. The emission

(c) Methodology and Sample Calculations:

Controlled Emissions (ton/yr) = Usage (ton/yr) x EF (lb/ton) / 2,000 lb/ton

PM2.5 emissions conservatively assumed to be equal to PM10 emissions.

$$\frac{158{,}894\text{ ton}}{\text{yr}} \left| \frac{0.27\text{ lb PM}}{\text{ton}} \right| \frac{\text{ton}}{2{,}000\text{ lb}} = \frac{21.5\text{ ton PM}}{\text{yr}}$$

VOC Emissions

Dryer Feed Rate (ton/yr)	Water Content[b] (% by wt)	VOC Content of Water[b] (lb VOC/lb water)	VOC from Dryers (ton/yr)
158,894	66.66%	0.006	635.5

Notes:

(a) Feed (wet cake) into existing steam tube dryer system is taken from

(b) Water content (% wt) and VOC content of water (lb VOC/lb water) taken

(c) Methodology and Sample Calculations:

VOC (ton/yr) = Dryer Feed Rate (ton/yr) x Water Content of Feed (% by wt) x (lb VOC/lb wat

$$\frac{158{,}894\text{ ton}}{\text{yr}} \left| \frac{66.66\text{ \% wt}}{\text{ton}} \right| \frac{0.006\text{ lb VOC}}{\text{lb water}} = \frac{635.5\text{ ton VOC}}{\text{yr}}$$